Code : 1G372

R-11

IV B.Tech. I Semester Regular Examinations Nov/Dec 2014

Digital Signal Processing

(Common to EEE & ECE)

Max. Marks: 70 **Time: 03 Hours**

Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1. a) Test the following systems for linearity, time-invariant, stability and causality.
   (i) $y(n) = x(n)\ x(n-2)$ (ii) $y(n) = \log_{10} | x(n) |$. 7M
   b) Determine the impulse response h (n) for the system described by the difference equation $y(n) = 0.6\ y(n-1) - 0.08\ y(n-2) + x(n)$. 7M

2. a) Prove the following DFT properties
   (i) Time reversal (ii) Circular time shift (iii) Circular convolution. 7M
   b) Compute the DFT of the sequence x(n) = {2, 2, 2, 2, 1, 1, 1, 1}. 7M

3. a) Derive the necessary three stage computation equations for radix-2 DIT FFT method. 7M
   b) Find the DFT of the sequence x(n) = {2,1,2,1,2,1,2,1,2}. 7M

4. Determine the impulse response and step response of the causal system given below and discuss on stability.
   $y(n) - y(n-1) - 2\ y(n-2) = x(n-1) + 2\ x(n-2)$. 14M

5. a) What is warping effect? How can you eliminate this problem? 4M
   b) Design the third order Butterworth digital filter using impulse invariant technique. Assume sampling period T = 1 sec 10M

6. a) Derive and draw the frequency of linear phase FIR filter when impulse response is symmetrical and N is odd 10M
   b) Compare the parameters of rectangular, triangular, Hanning and Hamming windows. 4M

7. a) What is decimation? 2M
   b) How can a sampling rate conversion by a factor of I/D achieved? 12M

8. Explain about
   a) Digital music synthesis. 7M
   b) Trans multiplexers. 7M

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Code : 1G271

R-11

IV B.Tech. I Semester Regular Examinations Nov/Dec 2014

Fundamentals of HVDC & FACTS Devices

(Electrical & Electronics Engineering)

Max. Marks: 70 **Time: 03 Hours**

Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1.	a)	What are the different applications of D.C. transmission system? Explain them in detail.	7M
	b)	With neat sketches explain the different kinds of D.C. links available.	7M
2.		Explain in detail the converter control characteristics of HVDC systems.	14M
3.		How do you estimate the harmonic order based upon pulse number of HVDC converter station? Give a detailed harmonic analysis of a 12 pulse converter for characteristic harmonics.	14M
4.	a)	Obtain the mathematical models of a DC link.	7M
	b)	Draw the flowchart of AC/DC load flow.	7M
5.		Explain the objectives of FACTS controllers in the power system network.	14M
6.		What is meant by midpoint compensation with respect to shunt compensation? Explain the advantages to the power system by adapting to it.	14M
7.		What are the objectives of series compensation? Explain them.	14M
8.		Explain the UPFC control scheme with block diagram.	14M

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Code : 1GA71

R-11

IV B.Tech. I Semester Regular Examinations Nov/Dec 2014

Management Science

(Common to EEE & CSE)

Max. Marks: 70 **Time: 03 Hours**

Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1. a) Discuss on Line, Line and Staff, Functional and Matrix Organisations 8M

   b) Discuss the Meaning, Nature, Importance of-Taylor's Scientific Management 6M

2. a) Discuss about Job, Batch and Mass Production systems 6M

   b) Define Work Study. And describe various steps involved for Method study and Work -measurement. 8M

3. a) Discuss the role of Product Life Cycle in marketing 7M

   b) Discuss the Core Concepts and Functions of Marketing 7M

4. a) What is HRM? Discuss basic functions of HR Manager 7M

   b) Discuss any two modern HR practices for productivity 7M

5. The following table gives the activities in construction project and time duration.

Activity	Preceding activity	Normal time(days)
1-2	--	20
1-2	-	25
2-3	1-2	10
2-4	1-2	12
3-4	1-3,2-3	05
4-5	2-4,3-4	10

   a) Draw activity network of project. 6M

   b) Find the total float and free float for each activity. 4M

   c) Determine the critical path and project duration. 4M

6. a) Discuss on elements of Corporate Planning Process 7M

   b) SWOT Analysis is vital in corporate planning. justify 7M

7 a) Discuss the basic concepts and overview of Management Information System (MIS) 7M

   b) What are the elements in Value Analysis? 7M

8. a) Discuss Normative Ethical Theories on Egoism, Utilitarianism and Altruism 7M

   b) Discuss the Ethical Issues In Operations Management 7M

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Code : 1G57E

R-11

IV B.Tech. I Semester Regular Examinations Nov/Dec 2014

Optimization Techniques

(Electrical & Electronics Engineering)

Max. Marks: 70 **Time: 03 Hours**

Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1. Explain the optimization problems based on their classification. 14M

2. a) Explain the concept of saddle point in detail. 7M

   b) Determine the maximum and minimum values of the function

   $f(x)=12\,x^5- 45\,x^4 + 40\,x^3 + 5$ 7M

3. a) Define the following

   (i) Feasible solution (ii) Optimal solution (iii) Vertex or terminal point 6M

   b) Maximize $z = 3\,x_1 + 5\,x_2$

   Subject to, $x_1 \le 4$

   $2x_2 \le 12$

   $3\,x_1 + 2\,x_2 \le 18$ $\quad x_1, x_2 \ge 0$

   Solve the problem using simplex method. 8M

4. a) Solve the following transportation problem using Vogels approximation method

					Supply
Demand	19	30	50	10	7
	70	30	40	60	9
	40	8	70	20	18
	5	8	7	14	

8M

   b) Solve the following assignment problem

	1	2	3	4
A	8	6	5	7
B	6	5	3	4
C	7	8	4	6
D	6	7	5	6

6M

5. Find the minimum of f = x (x - 1.5) in the interval (0.0, 1.00) to within 10% of the exact value. 14M

6. a) Consider the minimization of the function

   $F(x_1, x_2) = 6\,x_1^2 + 2\,x_2^2 - 6\,x_1\,x_2 - x_1 - 2\,x_2$. If $s_1 = \begin{Bmatrix}1\\2\end{Bmatrix}$ denotes a search direction, find a direction s_2 which is conjugate to the direction s_1 7M

   b) Write a flow chart for Powell's method. 7M

7. Minimize $f(x_1, x_2) = x_1^2 + x_2^2 - 4\,x_1 - 4\,x_2 + 8$ subject to $g_1(x_1,x_2) = x_1 + 2x_2 - 4 \le 0$ with the starting point $X_1 = \begin{Bmatrix}0\\0\end{Bmatrix}$

   Take $\varepsilon_1=0.001$ $\varepsilon_2= 0.001$ and $\varepsilon_3=0.01$. 14M

8. a) Explain the concept of multistage decision process. 7M

   b) Explain the classification of serial multistage decision problem with neat block diagram. 7M

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Code : 1G275

R-11

IV B.Tech. I Semester Regular Examinations Nov/Dec 2014

Renewable Energy Sources

(Electrical & Electronics Engineering)

Max. Marks: 70 **Time: 03 Hours**

Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1.	a)	What is the difference between a Pyrheliometer and Pyranometer? Describe the principal of Angstrom type Pyrheliometer?	8M
	b)	What are the reasons for variation in solar radiation reaching the earth than received at the outside of the atmosphere?	6M
2.	a)	Draw and explain the power generating system illustrating the use of concentrating collectors.	7M
	b)	What are the main components of a flat plate solar collector, explain the function of each?	7M
3.	a)	What are the main applications of a solar pond? Describe briefly.	6M
	b)	Describe the layout and working of a continuous solar cooling system.	8M
4.	a)	Write short notes on i) Savonius rotor ii) Darrieus rotor	6M
	b)	Discuss the performance characteristics of wind.	8M
5.	a)	Compare the fixed dome type plant and movable drum type plant.	8M
	b)	Write short notes anaerobic digestion?	6M
6.	a)	Explain different types of wells in Geothermal?	4M
	b)	What are the sub classification of hydrothermal convective systems? Describe a vapour-dominated or dry steam fields.	10M
7.	a)	What is the basic principle of ocean thermal energy conversion (OTEC)?	8M
	b)	What are the difficulties in tidal power developments?	6M
8.	a)	What is direct energy conversion? Explain the need of direct energy conversion.	6M
	b)	What are the various losses associated with operation of MHD generator?	8M

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Code : 1G272

R-11

IV B.Tech. I Semester Regular Examinations Nov/Dec 2014

Switch Gear and Protection

(Electrical & Electronics Engineering)

Max. Marks: 70 **Time: 03 Hours**

Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1. a) Derive the expression for Restriking voltage and RRRV. 7M

   b) A 50 Hz alternator has emf to neutral 7.5 kV (rms). The reactance of generator and the connected system is 4 Ω and distributed capacitance to neutral is 0.01 μF with resistance negligible. Find

   i) Maximum voltage across the circuit breaker contacts,

   ii) Frequency of oscillations F_n, iii) RRRV average upto first peak of oscillations. 7M

2. a) Enumerate the properties of SF_6 which render its use in high voltage circuit breakers. 7M

   b) Explain the construction, working and advantages of Vacuum circuit breaker. 7M

3. a) What is universal torque equation? Using this equation, obtain the characteristics of reactance and MHO relay. 7M

   b) What is meant by directional features of a directional over current relay? Describe the operating principle of directional over current relay. 7M

4. a) Discuss the merits and demerits of static relay over electromagnetic relay. 6M

   b) Draw the connection diagram of microprocessor based reactance relay and explain its operation with a suitable example. 8M

5. a) Describe the harmonic restrain relay used for the protection of transformer. 6M

   b) A star connected, 3 Phase, 10 MVA, 6.6kVA alternator is protected by Mertz Price circulating current principle using 1000/5 amperes current transformers. The star point of the alternator is earthed through a resistance of 7.5 Ω. If the minimum operating current for the relay is 0.5 Amps. Calculate % of each phase of the stator winding which is unprotected against earth faults, when the machine is operating at normal voltage. 8M

6. a) What is meant by time grading and time grading in protection system. 6M

   b) Compare the merits and demerits of various pilot wire protection schemes for protection of transmission lines. 8M

7. a) Discuss the advantages of grounding the neutral of the system and isolating the neutral. 6M

   b) A 50 Hz overhead line has line to earth capacitance of 1 μF. it is decided to use an earth fault neutralizer. Determine the reactance to neutralize the capacitance of (i) 100 % of the length of line (ii) 75 % length of the line. 8M

8. a) Explain How overhead transmission lines are protected from lightning strokes. 7M

   b) What is a surge absorber and explain about Ferranti surge absorber. 7M

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